

surface of each element (claim 1) or to the other element (claim 2). Support for this amendment is found in Figure 1 and 2

I. Rejection of Claim 1 Under 35 U.S.C. §102(b)

Claim 1 is rejected under 35 U.S.C. § 102(b) as being anticipated by WO 93/07958 ('958). The Examiner asserts that the '958 application discloses each element of the present invention.

This rejection is respectfully traversed as follows.

According to claim 1, the non-permeated fluid discharge outlet is formed in the container wall. Thus, it is not concentrically housed within a feed tube. This structure allows that the discharge tube may have any desired diameter, such that the diameter of the discharge tube may be substantially equal to or larger than the diameter of the feed tube, thereby preventing or decreasing pressure loss of fluid.

In contrast, the structure set forth in WO93/07958 includes a concentrically housed non-permeated fluid discharge outlet within a feed tube. As such, the diameter of the discharge tube is limited by the diameter of the feed tube and, in particular, is necessarily smaller than the diameter of the feed tube. Thus, the invention set forth in the '958 application does not anticipate the claimed invention.

Accordingly, the rejection of claim 1 under 35 U.S.C. §102(b) over the '958 application is respectfully traversed.

II. Rejection of Claims 2-4 Under 35 U.S.C. §103(a)

Claims 2-4 are rejected under 35 U.S.C. §103(a) as being unpatentably obvious over the '958 application in combination with Sekino et al. and Ethiene et al. The Examiner applies the primary reference as above, but notes that the '958 application fails to disclose a hollow fiber membrane apparatus with an inner liquid receiving plate and a connecting tube for connecting the feed tube of the second element. The Examiner relies on Sekino et al. as teaching a hollow fiber apparatus having at least two hollow fiber membrane modules and a feeding central perforated tube with a dividing member and a connecting tube.

The Examiner relies on Ethiene et al. as teaching a hollow fiber membrane housing having an outlet in communication with the space between the outside of the fibers and the container located near the end of the container. The Examiner asserts that it would have been obvious to one of ordinary skill in the art to provide the membrane module of the '958 application with a separating plate and conduit as suggested by Sekino et al. and to provide lateral discharge of retentate and alternatively, provide discharge at the end of the module as suggested by Ethiene et al.

The Examiner also asserts that the selection of distance from the discharge outlet from the opposite end of the module is an obvious choice depending on the module size, etc.

This rejection is respectfully traversed as follows.

The permselective membrane module set forth in present claims 2-4, like that of claim 1, is configured to have the non-permeate liquid outlet located in the container wall, rather than concentrically housed within a feed tube. As such, this configuration allows that the liquid outlet may have a diameter substantially the same or larger than that of the feed tube so that the loss of fluid pressure is decreased.

Furthermore, in the invention set forth in claims 3 and 4, the location of the non-permeated liquid discharge outlet is within the vicinity of the container side wall end. This configuration prevents suspended material in the non-permeated liquid from remaining at the site.

In contrast, the primary reference discloses an apparatus in which the outlet is concentrically housed within a feed tube and as such, is necessarily smaller than the feed tube. According to the '958 application, it is preferable to adjust the diameter of the discharge tube to half that of the feed tube in order to provide adequate flow rates of feed liquid in the feed tube and non-permeated fluid in the discharge tube. Due to this structural arrangement, if the diameter of the feed tube in the '958 application is the same as that used in the present invention, the loss in fluid pressure occurring at the non-permeated fluid discharge outlet of the '958 apparatus is at least four times that occurring in the present apparatus. Pressure loss is even greater when the size of the non-permeated liquid

discharge outlet is decreased.

The secondary references cited by the Examiner do not cure this defect in the structure of the '958 application, nor do the secondary references suggest that fluid pressure loss can be eliminated by locating the non-permeated liquid discharge outlet opposed to the outer surface of the other element and extending through the container wall. Moreover, the secondary references do not suggest that locating the non-permeated liquid discharge outlet in the vicinity of the container side wall end eliminates retention of suspended materials at the site.

Ethiene et al. disclose a structure in which the non-permeated liquid discharge outlet is situated in an internal fluid receiving plate (dividing member 3). As shown in Figure 7 of Ethiene et al., the opening passage (7) for discharge of non-permeated fluid in compartment (4) is located radially inwardly away by at least a specific distance from the side wall (circumferential wall) of container 1. This configuration is problematic in that suspended materials are likely to remain at a level lower than the opening of the passage (7) when the opening (9) is downwardly directed, as shown in Figure 7.

Sekino et al. discloses that the feed tube is passed through hollow fibers. A portion of the fluid is permeated through the side wall of the hollow fibers and discharged from the container side wall. The fluid discharge outlet is situated in the vicinity of the container end, not for discharge of non-permeated fluid, but for facilitating collection of permeated fluid. Such a structure does not suggest a solution to the problem of retention of suspended materials from the non-permeated liquid.

The combined prior art fails to disclose or suggest the present apparatus and in particular, fails to disclose or suggest either the structural causes of fluid pressure loss or retention of suspended materials at the non-permeated liquid discharge outlet site. Applicants have recognized these problems associated with permselective membrane modules and have resolved the problems in the claimed invention. As such, the present invention, as set forth in claims 2-4 is not obvious over the combined cited art.

Accordingly, the rejection of claims 2-4 under 35 U.S.C. §103(a) over the '958 application in combination with Sekino et al. and Ethiene et al. is respectfully traversed.

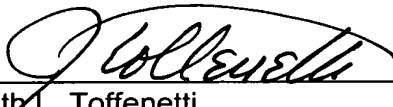
It is respectfully submitted that the present invention, as amended above, is in condition for allowance, an early notification thereof being earnestly solicited.

The Commissioner is authorized to charge any fees relevant to this filing to Deposit Account 11-0600.

Respectfully submitted,

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